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Fiscal Solvency and Sustainability in Economic Management

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In a financially integrated world, it is misleading to assess fiscal performance separate from other aspects of economic development. The framework proposed here can help assess fiscal performance over time and across countries and point to a pace of fiscal adjustment consistent with a country's economic and social objectives.

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Summary findings

Fiscal policy is central to a country's economic and social objectives, from macroeconomic stability to sustainable growth and poverty reduction. But evaluations of a country's fiscal performance, over time or relative to other countries, are often conducted independent of other development objectives, disregarding the links between fiscal, monetary, and exchange rate policies.

A budget deficit of 4 percent of GDP, for example, may be acceptable in one country but not in another, because of different initial conditions and policy priorities. In the same country, a level of fiscal deficit may be acceptable one year but not the next, depending on developments and changes in policy objectives.

Dinh argues for assessing fiscal performance (1) as part of the entire framework of economic policy, (2) against a policy objective, (3) by taking into account both short- and long-term considerations, and (4) with an eye to the quality of adjustment (whether there are income inequalities or other social issues, for example) as well as its magnitude.

The approach he proposes for assessing country fiscal performance requires a minimum of data and takes into account flow and stock variables on internal and external debt. The approach addresses the shortcomings of conventional analysis by incorporating the debt dynamics and other macroeconomic targets of growth, inflation, and external and internal debt. While its theoretical foundation is well known in the literature, this approach has not been adapted for assessing fiscal performance either over time or across countries, and he discusses practical issues arising from this adaptation. Dinh proposes two indicators to measure fiscal adjustment efforts:

- Fiscal solvency adjustment, which measures how far additional fiscal efforts must be taken to restore solvency to the fiscal sector.
- Fiscal sustainability adjustment, which measures how far additional fiscal efforts must be taken to maintain the ratios of internal and external debt to output.

Dinh applies the proposed framework to evaluate recent fiscal performance in three countries — Argentina, India, and Zambia — each with a different income level and located on a different continent. The countries were selected on the basis of recent World Bank economic work using the proposed approach or an equivalent. Dinh finds the proposed approach useful for identifying key fiscal issues, for assessing the adequacy and pace of fiscal adjustment consistent with the overall economic and social objectives, and for highlighting the tradeoffs between policy initiatives.

Sound fiscal policy is crucial for macroeconomic stability. When fiscal issues are under control, it is easier to coordinate other policies. When fiscal issues are part of the problem, the tradeoffs between policy outcomes become pronounced, and economic management, including the management of capital flows, becomes much more difficult.

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FISCAL SOLVENCY AND SUSTAINABILITY IN ECONOMIC MANAGEMENT

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FISCAL SOLVENCY AND SUSTAINABILITY IN ECONOMIC MANAGEMENT

I. INTRODUCTION

1. Fiscal policy plays a central role in helping a country achieve its economic and social objectives, from macroeconomic stability to sustainable growth and poverty reduction. However, the evaluation of a country's fiscal performance, either over time or in relation to other countries, is often conducted independently of other development objectives and/or of the linkages among fiscal, monetary, and exchange rate policies. In a financially integrated world, this approach is misleading because it sheds little light on a prudent level of fiscal deficit and consequently on the appropriate pace of fiscal adjustment. A budget deficit of 4 percent of GDP, for example, may be acceptable in one country but not in another because of different initial conditions and policy priorities. In the same country, a particular fiscal deficit level may be adequate in one year but not the next depending on internal and external developments and on changes in policy objectives. For international financial institutions, this absence of a yardstick to measure fiscal performance implies that the design of adjustment programs lacks common standards across countries and that lessons from the past cannot be effectively disseminated.

2. This paper argues that a simple approach based on solvency and sustainability could help assess fiscal performance over time and across countries in a consistent macroeconomic framework. This approach takes into account a number of factors. First, given the increasing interdependence among fiscal, monetary, and exchange-rate policies in a financially integrated world, fiscal performance cannot be analyzed in isolation; it must be assessed as an integral part of the policy framework. Second, fiscal performance should be measured against a policy objective. The adjustment effort to reach this objective depends on initial conditions, as well as the expected policy measures. Third, fiscal assessment should take into account both short-term and long-term considerations. In practice, this means policy performance must be analyzed from both long-run solvency and short-run sustainability perspectives, and given the close linkages with other policies, from both external and internal balance viewpoints. Fourth, fiscal policy is intimately linked to other political economy issues (income inequalities, social issues, and so on) so that the quality of fiscal adjustment is at least as important as its magnitude.

3. Section II reviews the role of fiscal policy in country economic management. Section III presents a model of fiscal solvency and sustainability and proposes two indicators to assess fiscal performance either over time or across countries: (i) fiscal solvency adjustment which measures how far additional fiscal effort needs to be undertaken to restore solvency to the public sector; and (ii) fiscal sustainability adjustment which measures how far additional fiscal effort is required without incurring new internal or external debt relative to output. This approach brings out the critical role of fiscal policy as an anchor for macro stability and also highlights the increasingly indistinct line between traditional internal and external

balances. Section IV discusses the need to supplement the proposed framework with in-depth knowledge of country-specific fiscal issues. Section V applies the proposed framework to evaluate fiscal performance in three countries: Zambia, India and Argentina. These countries have different income levels, are located in three different continents, and are selected on the basis of recent World Bank economic work using the proposed approach or equivalent. Section VI concludes and proposes directions for further research.

II. FISCAL POLICY AND ECONOMIC MANAGEMENT

4. Fiscal policy is critical in economic management for several reasons. In many developing countries, only the public-sector can borrow from abroad and repay the external debt. Thus, what happens to the public-sector has a direct bearing on the country's external debt and debt service. Of the total long term debt stock of developing countries in 1997, public-sector debt accounted for 86 percent[1]. Even if a country's external debt is contracted by the private-sector, experience has shown that governments often take over that obligation when the public-sector's credit rating is adversely affected by private-sector debt problems.

5. The importance of linkages between fiscal policy and other economic policies cannot be overstated. A country's deficit financing determines its domestic interest rates and inflation, which in turn drive exchange rate expectations and the private-sector's capacity to earn foreign exchange, and therefore repay debt. Fiscal policy, of course, can also affect private-sector growth directly by crowding out private investment. Another channel through which fiscal policy can influence economic activities is the micro effects that tax and spending decisions have on the behavior of households and firms. Thus a country's ability and willingness to repay its external debt obligations is closely linked to the ability of the public-sector to tax its residents and to use the revenue to buy foreign exchange for debt service payments.

6. Fiscal policy is not the only way that a government can influence economic activities. Other instruments include monetary, exchange-rate, financial, and income policies. The traditional separation of fiscal from other macro policies, particularly monetary policy, while useful as an analytical device, is no longer appropriate in the real world of developing countries for a number of reasons. If there is no independent central bank, monetary policy frequently accommodates fiscal policy. The dominant role and intervention of many governments in the financial sector also drives financial policy to depend on fiscal policy. And the limited domestic market for bonds and government debt instruments, together with limited access to international capital markets, often leave governments with few choices except inflation financing. Furthermore, in many transition economies, fiscal and monetary policies are indistinguishable.

7. New developments in international finance in the 1990s tend to reinforce linkages between fiscal and other macroeconomic policies. First, the world has become more

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[1] See Global Economic Prospects, 1999, p. 182.

integrated in trade and finance and has made it virtually impossible to insulate domestic policies (such as fiscal policy) from other policies (exchange-rate or interest-rate policies, for instance), either within or across countries. Second, there has been a surge in capital flows to developing countries in recent years. Some represent the return of flight capital of the 1980's but most inflows are direct and portfolio investment. These flows have important implications for fiscal policy as discussed later in this paper. Third, many developing countries are undergoing structural adjustment, including financial-sector reform and deregulation of capital markets. These measures will most likely lead to closer integration of fiscal policy with other macro policies.

8. Traditional economic theory emphasizes the distinction between domestic debt and external debt. Domestic debt is thought to be not as significant as external debt since it involves borrowing and lending decisions within a country, and because the government's ability to finance this debt by printing money is thought to be unlimited. External debt, on the other hand, has always been treated more seriously because transactions across national borders involve transfers of wealth to foreigners, and because debt-service payments are limited by foreign-exchange earnings. These views have proved to be wrong - misguided fiscal policies in developing countries in the 1970's led to the debt crisis of 1982. Hyperinflation in Latin America in the 1980s also showed that there is a limit to deficit financing through money creation. It is also interesting to note that while many countries chose to default their external debt in the 1980s, they continued to honor their domestic debt obligations. Moreover, the Mexican crisis of 1994-95 and subsequently the East Asian crisis demonstrated that with an open capital account, the stock of domestic debt could become closely integrated with external debt. Another phenomenon which strengthens the linkages between fiscal policy and monetary and exchange-rate policies is currency substitution or dollarization, which has become popular in many developing countries. These linkages make it impossible to examine fiscal policy independently from other macroeconomic policies.

9. Traditional fiscal theory tends to stress the neutrality of fiscal policy- that is, the best fiscal policy is one that minimizes distortions in the economy. Both tax and expenditure policies are judged on the basis of two micro criteria: efficiency and equity. The impact of fiscal policy on aggregate demand has received attention only in the past few decades. More recently there have been attempts to link fiscal policy to growth, through the new endogenous models of growth[2]. The consensus appears to be that while a prudent fiscal policy is a necessary, but not sufficient, condition for rapid economic growth, an imprudent fiscal policy hampers growth, jeopardizes macro stability, and carries high costs to the economy.

10. Cross-country analysis of fiscal performance is often difficult to carry out for several reasons. First, there is a lack of a common definition of fiscal deficit. Second, unlike variables related to the balance-of-payments, budget data are usually sparse and available

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[2] See William Easterly and Sergio Rebelo. *Fiscal Policy and Economic Growth: An Empirical Investigation.* NBER Working Paper 4499, October 1993.

only after a time lag[3]. There are only a handful of countries where fiscal data are adequate for any serious research. Third, given the different time and country-specific coverage of data and policy, fiscal performance cannot be compared across countries in a rigorous fashion. Fourth, because of the linkages with other policies, it is difficult to examine fiscal policy separate from other policy variables.

11. The lack of a common definition of budget deficit, in particular, makes it difficult to compare fiscal performance across countries. Ideally, the appropriate deficit to measure is the consolidated public-sector deficit which takes into account the whole public-sector - the equivalent of the current-account deficit on the external side of the economy. It would take into account not only central government, local governments, and municipal accounts, but non-financial public-enterprises, public-sector banks, the social security system, and the central bank. It would then be easy to review the impact such deficit would have on the "pure" private-sector of the economy. In practice, this may never happen for a number of reasons[4], not the least of which is that the definition (and calculation) of the deficit is likely to be dictated by data availability and the interest of the researcher. This choice also depends on the role of the public-sector in the economy. Therefore, a definition of budget deficit would need to be specified beforehand. The most comprehensive definition is that given by the IMF's Government Financial Statistics. Information from other official and unofficial sources are often more recent, but are not standardized nor systematic with regard to coverage and methodology.

12. Even more important than the coverage of fiscal deficit is the appropriate level of this deficit and the speed of fiscal adjustment. As mentioned earlier, a budget deficit of, say, 4 percent of GDP may be adequate for one country but not for another because fiscal policy is an integral part of the policy framework. It may be adequate for an economy with single digit-inflation but may be woefully inadequate for a country with 70 percent inflation. Similarly, a target reduction in the budget deficit, (say, 2 percentage points of GDP), may not be nearly enough for an economy where the exchange rate is being used as a nominal anchor but may be sufficient for one in which money supply serves as the anchor.

13. Because of the strong linkages between fiscal, monetary, and other macro-economic policies, the appropriateness of a particular fiscal deficit target depends on other targets for growth, inflation, and external and internal debt. Unless these linkages are brought out explicitly, conventional fiscal measures (such as the deficit to GDP or government debt service to revenues) shed little light on the appropriate level of fiscal deficit and consequently

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[3] It is not unusual to find data three years or older in many official or unofficial documents, for example, the IMF publication on budgets, the Government Financial Statistics.

[4] Even if a consolidated fiscal account were available, the line drawn between public and private enterprises would always be arbitrary. Even within a closed economy, the conventional measure of fiscal deficit (the difference between total revenues and expenditures) has limitations in assessing the impact of fiscal policy on aggregate demand. For developing countries, these problems are compounded by inflation, debt arrears, and quasi-fiscal activities, as well as the temporary nature of some fiscal measures (such as the sale of public assets). Indeed, a recent IMF study has concluded that there is no such thing as the fiscal deficit. See M. Blejer and A. Cheasty, Eds. *How to Measure the Fiscal Deficit*. IMF, 1993.

on the appropriate speed of fiscal adjustment. For international financial institutions, this also implies that the design of adjustment programs lacks rigor and standards across countries and that lessons from the past cannot be effectively disseminated. The model presented in the next section addresses some of these serious issues.

III. A MODEL OF FISCAL SOLVENCY AND SUSTAINABILITY

Fiscal Solvency

14. The distinction between solvency and liquidity problems of the public-sector is derived from the theory of finance. A firm is insolvent if its net worth (assets minus liabilities) is negative, and is illiquid if it cannot meet its obligations. A company can be solvent (have a positive net worth) yet experience cash flow (liquidity) problems. On the other hand, it could have a positive cash flow and still be insolvent. The distinction is important in an accounting sense, because solvency relates to the asset side of the balance sheet (net worth), while liquidity relates to liabilities. In practice, they are closely related. By definition, net worth is a balancing item and includes liabilities. Moreover, the terms solvency and illiquidity are almost interchangeable when describing an institution or country in crisis. The real distinction is the implication that solvency is irretrievable and must lead to liquidation, whereas illiquidity may be a temporary state.

15. For the public-sector, the concept of solvency is derived from the definition that, just like any other entities in the economy, it has to satisfy the intertemporal budget constraint:

$$\int_{o}^{\infty} S_t e^{-rt} dt = B_0 . \qquad (1)$$

where S_t is the primary balance (budget balance, excluding interest payments) in period t, r is the discount rate, and B_0 is the initial level of public debt. Ideally, this public debt should be net - that is, include other public-sector assets and liabilities[5]. It can be shown that equation (1) is true if, and only if, the transversality condition is satisfied[6]:

$$\lim_{t \to \infty} B_t \exp^{-rt} = 0 \qquad (2)$$

16. The above equation states that the present discounted value of a country's public-sector debt falls to zero as time progresses. This does not mean that debt should go to zero or even stay constant. Debt can grow at a positive rate in the long run. Of course, a permanent fiscal deficit is inconsistent with the above condition. A deficit at any point in time (or over a period of time) has to be offset by a surplus at another point in time.

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[5] For the above integral to be bounded, r has to be positive. If r is negative, the debt would explode - that is, it would be beneficial to borrow forever. As shown by Diamond (1965), in these economies, current debt increase has no impact on future surpluses.

[6] See, for example, Cohen (1991) for the external debt for an infinitely lived economy with finite wealth.

17. Define s* as the proportion of output that holds equation (1) above, we have

$$\int_{o}^{\infty} s^{*} e^{(g-r)t}\, dt = \frac{B_0}{Y_0} \qquad (3)$$

Solving for s* yields

$$s^{*} = \frac{B_0}{Y_0}(r-g) \qquad (4)$$

Where Y is output (GDP), g is output (GDP) growth rate, and B_0 is the initial government debt. Note that one could define s* as a proportion of government revenue rather than of output.

18. As the above equations show, s* is the proportion of output that would keep the public-sector solvent. The higher s* is, the greater is the proportion of output that must be devoted to debt service to keep the public-sector solvent. Thus, for a B_0 of 0.65, a differential in interest rate and GDP growth of 0.05, the public sector solvency index, s*, is 0.03 - that is, about 3 percent of GDP would have to be devoted to debt servicing for the government to be solvent.

19. Most countries are net debtors, i.e., $\frac{B_0}{Y_0} > 0$, and equation (4) states that for these countries, a primary budget surplus is required to attain fiscal solvency if the real rate of interest exceeds output growth, i.e. , (r-g)>0. The public sector has to make debt service payment at least equal to s*, or equivalently, it should have a primary surplus equal to s*. A primary fiscal surplus less than that amount (or a primary fiscal deficit) in that case implies perpetual public sector borrowing and debt accumulated indefinitely. For a country whose rate of output growth exceeds the real rate of interest, (r-g)<0, incurring a primary deficit is still consistent with solvency. However, a deficit higher than s* implies that the country is moving away from a fiscal solvency position. As will be shown below, many developing countries are facing either a GDP growth rate lower than the real rate of interest, or a primary deficit much larger than one consistent with solvency defined in (4) above.

20. Equation (4) above provides a method to assess a country's fiscal position over time and across countries. The difference between s* and the actual primary deficit measures how far additional fiscal efforts need to be undertaken to restore solvency to the public sector and is referred to as *fiscal solvency adjustment* in this paper. A positive number indicates that the country in question needs to make fiscal adjustments to restore solvency. A negative number indicates that no adjustment is required. The evolution of this indicator over time shows

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[7] The above equation was constructed on continuous terms. In discrete terms, it could be shown that (r-y) becomes $\frac{r-g}{1+g}$.

whether a country is moving closer or farther from a fiscal solvency position[8]. Note that for any given actual primary surplus, the higher output growth, the smaller is the required fiscal adjustment.

21. In equation (4), the fiscal solvency adjustment depends on a static component (the traditional value of initial debt to output ratio) and on a dynamic component (the expected real interest rate and real output growth). It is this dynamic component that the solvency concept introduces to conventional measures of the public-sector debt overhang. It could be argued that it makes little sense to use conventional ratios, such as debt-to-GDP, to measure the domestic debt overhang because a debt-to-GDP ratio of, say, 65 percent may be low for a country whose growth prospects are considerable but high for a country where growth is declining. Similarly, a given amount of fiscal adjustment may be adequate in a country where growth can be readily restored (for example, where structural reforms have already been undertaken) but inadequate in one where economic growth is low due to policy distortions[9].

22. No matter what the initial public debt stock is, if $g > r$, and if the public-sector's primary surplus is equal to interest payments, (that is, net debt is rolled over), the country's debt remains constant and its discounted value approaches zero as time progresses[10]. The public-sector will remain solvent as long as the real interest rate is less than the real output growth. This is because the mechanics of compound interest rates is such that as long as the real rate of interest is positive, the discounted value of debt will vanish as time approaches infinity. However, a situation where the long run growth rate of output is permanently higher than the real rate of interest is not possible because it implies inefficient economies.

23. While the concept of solvency is important for new creditors, it is not relevant for existing creditors. In the late 1970s, for instance, New York city was broke - that is, both illiquid and insolvent - but this did not prevent creditors from getting together to bail out the city. The issues facing existing creditors are different from those facing new creditors. Existing creditors are looking at alternative actions to recover assets, while new creditors are faced with choosing the best rate of return for their money among a range of investments. Thus knowing a country is insolvent may help new creditors but does little for existing creditors. What matters for existing creditors is not whether the public-sector is insolvent, but whether the current fiscal stance would move the country away from or closer to solvency. The direction of policy change is an important factor in determining whether creditors continue to rollover old debt and/or acquire new debt, or whether an exit strategy is more appropriate[11].

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[8] Note that this is not an equilibrium fiscal position in the traditional sense of the word.

[9] This statement assumes that the fiscal adjustment undertaken is growth neutral.

[10] Assuming the real interest rate is positive

[11] In fact, the proposed approach, when combined with contingent liabilities and quasi-fiscal accounts, could explain many currency crises such as those of the East Asian countries in the post-1997 period.

Fiscal Sustainability

24. The above concept of fiscal solvency requires knowledge of several long run variables: real interest rate and real growth rate, both are not directly observable and have to be approximated. As discussed below, one could use the actual real rate of interest as a proxy for the long run real interest rate and real GDP growth in the past as a proxy for long-run output growth. Another proxy for the real discount rate is the opportunity cost of capital or marginal product of capital.

25. Alternatively, one could observe a one-period budget constraint to infer about solvency condition in the future. We define fiscal sustainability the one-period condition such that solvency can be assured in the future. Fiscal sustainability can be derived from the instantaneous view of the budget constraint:

$$D + iB + Ei^{*}(1-\mu)B^{*} = \dot{B} + E\dot{B}^{*}(1-\mu) + \dot{M} \qquad (5)$$

where D is the primary fiscal deficit, *i* is the nominal interest rate paid on domestic debt, B is the public-sector's domestic debt, and E is the nominal exchange rate (domestic currency per unit of foreign exchange). A star next to a variable indicates the external sector and a dot above a variable indicates its rate of change. Thus, B* is the public-sector's foreign debt, $\dot{B}$ is the change in domestic debt, i* is the nominal interest rate paid on foreign debt. M is the monetary base, and μ is the grant or "soft money" component of the budget. For many low-income countries, grants are an important component of the budget.

Divide (5) by P and arrange to express in real terms, defining b=B/P and b*=EB*/P: and note that :

$$(\dot{B}/P) = \dot{b} + b\hat{p}$$

and $(E\dot{B}^{*}/P) = \dot{b}^{*} - b^{*}(\hat{e} - \hat{p}^{*})$

Equation (5) can be expressed as:

$$d + ib + i^{*}(1-\mu)b^{*} = \dot{b} + b\hat{p} + (1-\mu)(\dot{b}^{*} - b^{*}(\hat{e} - \hat{p}^{*}) + m(\hat{p} + g)$$ or

$$d + ib - b\hat{p} + (i^{*} - \hat{p}^{*} + \hat{e})(1-\mu)b^{*} = \dot{b} + (1-\mu)\dot{b}^{*} + m(\hat{p} + g)$$

where g is the growth rate of output. Rewrite:

$$d + rb + (1-\mu)b^{*}(r^{*} + \hat{e}) = \dot{b} + (1-\mu)\dot{b}^{*} + m(\hat{p} + g)$$ where $r = i - \hat{p}$

Divide the above by y

$$d/y + rb/y + (b^{*}/y)(1-\mu)(r^{*} + \hat{e}) = \dot{b}/y + (1-\mu)\dot{b}^{*}/y + (m/y)(\hat{p} + g) \qquad (6)$$

Define $\beta = \frac{b}{y}$; $\beta^{*} = \frac{b^{*}}{x}$

Hence $\dot{b}/y = \dot{\beta} + \beta g$; and $\dot{b}^{*}/x = \dot{\beta}^{*} + \beta^{*}\hat{x}$

or, in terms of y,

$$\frac{\dot{b}^*}{y} = \frac{x}{y}(\dot{\beta}^* + \beta^* \hat{x}) \tag{7}$$

Hence

$$\frac{d}{y} + \frac{rb}{y} + \frac{(1-\mu)b^*(r^* + \hat{e})}{y} = \frac{\dot{b}^*}{y} + (1-\mu)\frac{\dot{b}^*}{y} + \frac{m}{y}(\hat{p} + g) \tag{8}$$

or,

$$\frac{d}{y} + r\beta + (1-\mu)(x/y)\beta^*(r^* + \hat{e}) = \dot{\beta} + \beta g + (1-\mu)\dot{\beta}^* + \beta^* \hat{x}) + \frac{m}{y}(\hat{p} + g)$$

Also from the quantity theory of money:

$$Mv = Py \tag{9}$$

In the short term, assuming a fixed velocity of money demand v, m/y=1/v

Hence

$$\frac{d}{y} = \dot{\beta} + (1-\mu)\frac{x}{y}\dot{\beta}^* + \beta(g-r) + (1-\mu)(x/y)\beta^*(\hat{x} - r^* - \hat{e}) + 1/v\,(\hat{p} + g)$$

(10)

Equation 10 shows a snapshot of the government budget constraint. This constraint depends on a number of factors, including the existing stock of domestic and foreign debt β and β^*; real interest and growth rates, r and g; the proportion of exports in national output $\frac{x}{y}$; export growth rate $\hat{x}$; real international interest rate r^*; real exchange rate change $\hat{e}$; the inverse of the velocity of money demand $\frac{m}{y}$, and inflation rate $\hat{p}$.

26. We now define the condition for public sector sustainability as one with $\dot{\beta} = \dot{\beta}^* = 0$, or

$$\frac{d}{y} = \beta(g-r) + (1-\mu)(x/y)\beta^*(\hat{x} - r^* - \hat{e}) + 1/v\,(\hat{p} + g) \tag{11}$$

The condition states that there are three possible sources of financing the primary fiscal deficit in a sustainable way : domestic borrowing if output growth is greater than the interest rate on domestic debt; by external borrowing when export growth is higher than international interest rates, plus currency depreciation; and by money financing when it is consistent with

seignorage. Because it relates to a one-period budget constraint, it also shows the liquidity constraint of the public sector.

27. Define $s^{**} = -\frac{d}{y}$ as the primary surplus (expressed as a percentage of output) needed to achieve debt sustainability for the public sector,

$$s^{**} = \beta(r-g) + (1-\mu)(x/y)\beta^{*}(r^{*} + \hat{e} - \hat{x}) - 1/v\,(\hat{p} + g) \qquad (12)$$

Equation 12 constitutes the necessary and sufficient condition for debt sustainability of the public-sector.

28. To assess progress of fiscal policy, the above formulation of fiscal sustainability condition needs to be compared to the actual fiscal deficit. We define fiscal sustainability adjustment the difference between the sustainable primary balance defined in equation 12 above and the actual primary balance. A positive number indicates the need for fiscal adjustment and a negative number indicates no adjustment is required as far as fiscal sustainability is concerned. The evolution of this number over time is important from a policy standpoint because its indicates whether the existing fiscal stance would drive the country away or towards sustainability.

29. The sustainability condition of the fiscal deficit, equation 12, differs from the solvency condition, equation 4, in several respects. First, it is a one-period-budget constraint, unlike the intertemporal budget constraint of equation 4. Second, data for equation 12 are observable and are readily available. Third, for $\mu = \beta^{*} = 0$, s^{**} is smaller than s^{*} by the amount of inflation tax (including seignorage) which one can extract from the public in any period but presumably not in the long run.

30. The two indicators proposed above, s^{*} and s^{**}, can address the shortcomings of the conventional fiscal indicators in a number of ways. They take into account the existing stocks of internal and external debt, as well as other macroeconomic variables such as export growth, real interest rates, real exchange rates. Fiscal performance is assessed against long run solvency perspective, as well as short run liquidity. The adequacy of fiscal efforts therefore can be evaluated both within a country and across countries over time. There is less dependence on the coverage of fiscal data than on movements away from or towards a policy objective. However, given the linkages between fiscal policy and other macroeconomic policies, these indicators need to be supplemented by a qualitative analysis of fiscal issues.

31. The short-term sustainability condition in equation (12) applies to the fiscal deficit at any point in time. Summing up equation (12) for all time periods will lead to the solvency condition (4), although the converse is not true. Equation (12) differs from equation (4) in several aspects. First, (12) is a snapshot of the fiscal situation at a particular time, whereas

equation (4) covers all time periods. Second, because of its short-term nature, equation (12) deals with actual economic conditions at a particular time.

32. The same concept of public sector solvency and sustainability discussed in this paper can be extended to the entire country. In another paper, we derive two indicators to measure the required adjustment for external debt solvency (external solvency adjustment) and required adjustment for external sustainability (external sustainability adjustment) of a country. Box 1 below shows the four indicators and their relationships to internal and external balance. Annex Table A2 shows an example for India.

Box 1: Solvency and Sustainability Indicators for Internal and External Balance

	External Balance	*Internal Balance*
Solvency	External Solvency Adjustment	Fiscal Solvency Adjustment
Sustainability	External Sustainability	Fiscal Sustainability Adjustment

IV. QUALITATIVE ASPECTS OF FISCAL SOLVENCY AND SUSTAINABILITY ANALYSIS

33. The fiscal solvency and sustainability conditions by no means imply a plausible or realistic outcome. The solvency condition shows a fiscal position that at the very least, does not lead to an explosive debt while the sustainability shows a fiscal position which would be consistent with other policy targets, such as inflation, export growth and GDP growth. The path from the existing fiscal position to a solvent or sustainable one depends on the political powers of the current government, the strength of the opposition groups, and ultimately the willingness of citizens to undertake adjustments today for a better future. Whether a particular path of fiscal adjustment should be taken therefore depends on the judgments of policy makers. The proposed analysis serves to bring all the relevant policy variables into a coherent framework and helps focus attention on the key policy constraints to a solvent and sustainable fiscal position.

34. Given the complexities involved, it is important that the quantitative analysis be supplemented by in-depth, country-specific qualitative analyses of fiscal issues. Among the important qualitative fiscal issues are:

- The country's track record in reducing the budget deficit.

- The size and growth of the consolidated budget deficit to GDP and the size of public-sector borrowing requirement to GDP.

- The importance of non-central government accounts such as extra-budgetary accounts, social security system, central bank, public-enterprises, public-sector banks, and semi-public organizations

- Whether the root cause of budget imbalance comes from the revenue side, or the expenditure side, or both.

- The structure of revenues: direct vs. indirect taxes, other potential sources of revenues such as implicit or explicit subsidies.

- The buoyancy of the tax system and the degree of rent capturing which could be subject to exogenous shocks.

- The transitional nature of revenues: sources of revenues (such as sale of public assets) that may not be permanent.

- The structure of expenditures: recurrent vs. capital expenditures. Within each category, potential sources of cuts and their impact on the efficiency and equity of public service delivery: the wage bill, subsidies, operations and maintenance, and capital expenditures.

- The impact of domestic borrowing on private investment, on the financial sector and the banking system (for example, banks are required to hold a percentage of deposits in Government bonds). Impact of external borrowing on debt servicing problems. Impact of inflation on growth, investment and income distribution.

- Other methods of financing the budget deficit: seignorage, inflation tax, and sale of government assets.

- The extent to which the budget has been affected by the stock of domestic debt and by inflation.

- The extent to which the public-sector has generated foreign exchange to service its debt payments. In this context, the nature of the current exchange rate regime, including the restrictions on current-account and capital-account transactions.

- The extent to which the Government has received grants and soft money from foreign governments to finance projects whose expenditures are included above the line.

V. FISCAL AND QUASI-FISCAL DEFICITS AND COORDINATION OF MACROECONOMIC POLICIES

35. The strong linkages between fiscal policy and monetary and exchange rate policies have also reflected in the emergence of quasi-fiscal deficits in the last two decades, beginning first in Latin America and later in other countries including East Asian countries. A quasi-fiscal deficit is a deficit caused by the central bank's operations which are not directly related to the financing of the public-sector deficit. These operations are not captured in the normal budgetary operations and are usually hidden from public-sector accounts. Operations that give rise to quasi-fiscal activities typically involve the central bank's guarantees of exchange rates and interest rates on loans to commercial banks or to other agents such as public enterprises, provincial banks etc. Thus, when the exchange rate is subsequently devalued or interest rates are raised, the central bank finds itself paying for the mismatch between assets and liabilities.

36. In many Latin American countries, quasi-fiscal deficits are also used to indirectly finance the budget deficits. The central bank could raise reserve requirement thereby increase the demand for money and provide a temporary, non-inflationary means to finance the budget deficit . In effect, this amounts to a tax on financial intermediation. At other times, the central bank would need to pay interest for its past losses. In fact, it is often difficult to estimate quasi-fiscal deficits with accuracy because any point in time, a central bank's liabilities are accumulated over time with different (subsidized) interest rates and exchange rates. In some countries, quasi-fiscal deficits also involve public-enterprise activities, mainly because of the lack of independence between the central bank and the ministry of finance, which usually finances losses incurred by these enterprises.

37. While the macro-economic effects are similar, there are two features that distinguish quasi-fiscal deficits from regular fiscal deficits. First, unlike the ministry of finance, a central bank does not have any authority to tax real economic activities to finance its operations. Financing a quasi-fiscal deficit therefore entails printing money. Second, the true magnitude of quasi-fiscal deficits is usually hidden because only a small part of the contingent liabilities shows up in the budget. Analysis of solvency and sustainability therefore should always take into account the stock of contingent liabilities.

38. In the above model, the existence of a quasi-fiscal deficit reduces the level of fiscal sustainability, everything being equal. Let α be the quasi-fiscal deficit, defined as a proportion of the change in the monetary base; α includes the central bank's interest payments on its existing debt stock. It can be seen that the sustainable budget deficit is now reduced by $(\alpha / v)\ (\hat{p} + g)$.

39. The existence of these quasi-fiscal deficits implies that to successfully address any issue concerning interest rates, exchange rates, the budget, public enterprises, and the financial sector, the authorities need to address all these issues simultaneously. Policies affecting the real sector therefore need to be closely coordinated with the financial sector. In

the absence of a public-enterprise reform, for example, raising interest rates could help improve the allocation and mobilization of financial resources in the economy but could also adversely affect the profitability of public enterprises which, given the soft budget constraint and/or absence of an independent central bank, could lead to an increase in the budget deficit or quasi-fiscal deficit. In the end, therefore, how high interest rates should be raised depends on how much the budget could absorb the losses from the real side. The same hold true in the case of a banking crisis.

40. Fiscal issues have to be tackled simultaneously with reforms of the financial sector and of the public-enterprise sector. It is not an accident that in countries where budget deficits are high, domestic interest rates are kept low and often negative in real terms. Macroeconomic reforms can only be effective when sustained by these micro and structural measures. Since the impact and speed of response of each type of reform on the economy is different from one another, policy coordination is a key element for the success of stabilization and sustained growth.

41. The interrelationship between fiscal and other macroeconomic policies can be seen clearly in high-inflation economies. The experience of these countries shows that while fiscal policy appears to be a necessary condition, it alone is not a sufficient condition for stabilization, In these economies, authorities have often resorted to orthodox stabilization programs to bring down inflation, either through an exchange rate based regime, or a money supply based regime. As discussed in Kiguel and Leviathan[12], money-based stabilization programs (as in Argentina in 1976-78 and Chile in 1974-75) often caused high costs to the economy in the form of lower output and higher unemployment. Moreover, these programs, which entail stringent fiscal policy, brought inflation down from hyperinflationary levels only after a long time, and even then, inflation would be sticky downwards after reaching double-digit figures and would remain stubbornly high. On the other hand, countries that adopted the exchange rate based regime, with or without a stringent fiscal policy, also ended up with large real exchange rate appreciation, big current-account deficits, and eventually a balance-of-payment crisis[13].

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[12] See, for example, Kiguel and Liviathan, Exchange Based Stabilization Programs,WB Staff Paper 1318.

[13] Kiguel and Leviathan pointed out the experience of Argentina in 1978-80 when inflation fell from 175 percent in 1978 to 100 percent in 1980, at a cost of real exchange rate appreciation of 45 percent. The current-account balance swung from surplus to deficit (3 percent of GDP in 1980) which led to a balance-of-payments crisis. Part of the reason was the laxed fiscal stance: the fiscal deficit reached 8 percent of GDP in 1980, while monetary policy was tight leading to high domestic interest rates. Chile's experience in 1978, on the other hand, showed that even with a strong fiscal position, an exchange rate based program could still lead to a balance-of-payments crisis. When the exchange rate appreciated by 20-30 percent and the current-account deficit reached 14 percent of GDP in 1981, flight capital began leaving the country and a crisis broke out. During this period, however, the public-sector maintained a surplus in the primary, operational, and overall balance of GDP.

VI. EMPIRICAL ANALYSIS

42. In this section, we apply the above model to evaluate fiscal performance in three countries: Zambia, India and Argentina. These countries have different income levels and are located in three different continents. We compare the derived fiscal indicators with conventional fiscal indicators and show that the proposed indicators are both richer in a normative and positive sense to conventional indicators. The three countries are selected on the basis of formal fiscal analyses which were based on the above model of solvency and sustainability or equivalent and whose results have been presented in World Bank economic reports[14]. These countries also cover a range of different stages of economic development, as well as fiscal problems commonly seen in developing countries. In all cases the empirical results have been discussed with Government officials so that no policy surprises are expected. Before reviewing the empirical results, issues concerning data and interpretation are summarized below.

Data Problems and Issues

43. **Problems in estimating public sector activities**. Ultimately, any model is as good as the data it applies to and this model is no exception. As discussed earlier, a correct measurement of fiscal activities is a necessary condition for good fiscal analysis. A country's fiscal problems can be easily hidden if a comprehensive measure of fiscal activities is not available. But comprehensive information on accounts of the non-financial public sector – other than that of the central government—such as local government, extra-budgetary funds, state-owned enterprises, and government guarantees are often hard to get and if available, are often not up-to-date. The losses of state-owned enterprises (SOEs) often created a huge implicit liability to the government. In order to finance its operating losses, SOEs usually rely on issuing short-term debt with credit on inventory and future sales of output. Ultimately, these losses will be borne by the public sector, either because the debt will be taken over by the Government or because public assets will be depleted at the time of privatization.

44. **Domestic Debt**. Of the variables that are required for the above framework, the hardest to find is stock of domestic debt. This perhaps reflects economists' tendency to focus more on flows than stocks. The definition of domestic debt has to be consistent with the fiscal deficit in use. For example, if the available fiscal accounts do not include social security operations, the domestic debt should net out transactions between the central government accounts and the social security system. For many countries, available data do not include any information on domestic debt. Because the ability to issue domestic debt instruments depends more on the development stage of the financial sector than on budget needs, it is not surprising that for many low income countries, the stock of domestic debt is not significant compared to the external debt of the public-sector. For those countries with a

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[14] See Zambia: Fiscal Management Report, World Bank Report 18552-ZA, November 1998; India Country Economic Memorandum, Report Number 15882-IN, August 8, 1996, Chapter 3; Argentina: The Fiscal Dimension of the Convertibility Plan, Report No. 16996-AR, January 1998.

sophisticated financial market, however, the stock of domestic debt appears large and may exceed external debt. Annex Table A1 provides data on domestic debt of some developing countries.

45. **Discount Rates and Solvency Adjustment**. In equations (4), B_0 is the public-sector debt, and includes both domestic and external debt, the latter denoting public and publicly-guaranteed debt. The discount rate applied to this debt is a weighted sum of the discount rates used for each component, the weights being their respective shares. In a neoclassical framework, these rates are equal to the long-run costs of capital at home and abroad, respectively, and can be closely approximated by the real interest rates that would prevail in markets free of distortions. In industrial economies, the long-run real interest rate is estimated between 7 and 12 percent[15]. For developing countries, the scarcity of capital would imply a higher real rate of interest. A 10-15 percent real rate of interest is usually considered appropriate.

46. In a recent paper, Elmendorf and Mankiw [16]calculated the marginal product of capital (MPC) in the United States between 1960-1994. The number they obtained was 9.5%, using the share of capital in output and the capital-output ratio. The former was about one-third and the latter was about three. This number represents the gross marginal product and shows how much an extra dollar of capital adds to gross output and income. The use of a discount rate of 10% for developing countries is therefore within a reasonable range.

47. Similarly, in equation (12), β and β^* denote domestic and external debt, and the interest rate applied to each refers to the actual rate that prevail in the domestic and external capital market respectively. In many developing countries, however, a combination of financial repression and public sector interventions often result in artificially low domestic interest rates. For many low income countries, the availability of concessional resources and difficult access to the international markets also mean that the actual international interest rates are low. Hence, the use of actual interest rates will result in underestimating the opportunity cost of capital. For cross-country comparison of fiscal performance, moreover, it can be argued that the choice of a common discount rate is important as international capital flows are becoming more integrated.

48. **Effects of devaluation**. The treatment of a real devaluation for sustainability analysis is entirely short-term, that is, a real devaluation causes an increase in the debt service burden and therefore requires further fiscal adjustment. In a sense, this reflects a trade-off between policies for internal and external balance. Everything being equal, and under the right conditions for demand and supply elasticities and for production capacity, a real devaluation would improve the external current account balance but worsen the budget deficit.

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[15] See, for example, M. Boskin , "Taxation, Saving, and the Rate of Interest," *Journal of Political Economy*, Vol. 86, April 1978.

[16] See D.W. Elmendorf and N. G. Makiw, "Government Debt", p. 20, January 1998. Paper prepared for the forthcoming Handbook of Macroeconomics.

Fiscal Solvency and Sustainability in Zambia

49. Since 1991, Zambia has embarked upon a far-reaching adjustment program supported by the international community. Prices controls and subsidies (once over 10 percent of the budget) have been abolished, exchange and interest rates have been liberalized, and serious trade reforms have transformed the Zambian trade regime into one of the most outward-oriented in the sub-region. The central government budget deficit (after grants and debt rescheduling) declined from 7% of GDP in 1991 to about 2.3% in 1997[17]. Tax revenues (excluding grants) reached about 19% of GDP in 1997, a respectable level for low income countries, thanks to the establishment of the Zambia Revenue Authority (ZRA) in 1994 and the introduction of a broad based value-added tax in 1995. An ambitious public sector reform program has also begun. But despite this impressive pace of liberalization, Zambia has not been able to achieve macroeconomic stability and growth. Annual inflation was closed to 30% in 1997-98 while the average annual GDP growth was less than 1 percent between 1994-98.

50. The Zambia budget has several special features. First, budget revenues are heavily dependent on foreign grants and, until recently, on copper-related earnings. Second, expenditures are dominated by external debt service, the single largest expenditure item. Third, despite the declining trend in the central government budget deficit, fiscal adjustment has oscillated widely, with bouts of sharp fiscal adjustment followed by prolonged periods of inaction and worsening deficits.

51. More importantly, while the focus of fiscal adjustment has been on the budget deficit of the central government, and rightly so at early stages of the reform program, there are indications that the overall fiscal position of the country has shown little improvement because the deficits of the other levels of the public sector, such as local governments, state-owned enterprises, pension funds, special funds, and quasi-fiscal activities, have not been brought in control. Thus, the local governments have been adversely affected by declining grants from and rising arrears of the central government, the country's pension funds are suffering because of the enormous level of government arrears, and most importantly, state-owned enterprises continue to represent a huge drain on public resources. Although most state-owned enterprises in Zambia have been privatized over the past few years, the few remaining parastatals have continued to experience financial problems. Operating losses of the largest state-owned enterprise, the Zambia Consolidated Copper Mine (ZCCM), accounted for about 5 percent of GDP in 1996 and 3.4% of GDP in 1997. These losses will be borne eventually by the public sector.

52. The non-financial public sector deficit—which includes the central government deficit plus the deficits of local governments, extra-budgetary funds (such as pension funds and the Road Fund), and state-owned enterprises—is estimated at about 10.4 percent of GDP in 1997, compared to the central government deficit of 2.3 percent of GDP (Table 1). In

[17] See Zambia: Fiscal Management Report, World Bank Report 18552-ZA, November 1998.

addition, the cost of quasi-fiscal activities undertaken by the central bank (including the central bank's implicit bearing of foreign exchange risk for domestic residents who borrow externally and the rescue of failed commercial banks and the corresponding issue of liabilities by the central bank to a fragile financial system) is estimated at close to 3% of GDP in 1997. These estimates are preliminary, but they reveal the presence of a considerable quasi-fiscal deficit and indicate that substantial resources will be needed to re-capitalize and improve the operations of non-central government institutions.

Table 1: Zambia: Conventional Fiscal and Quasi-Fiscal Deficits (in percent of GDP)

	1995	1996	1997
Central Government Deficit Excluding Grants	-4.6	-2.5	-2.3
Non-financial Public Sector Deficit	-9.3	-11.6	-10.2
Central Bank			
Foreign Exchange Losses			
Special Holdings of Govt Securities (prior to 1996)	-9.1	-4.6	-2.9
Payments to Failed Banks[a]	NA	-1.5	-0.5
Central Bank Deficit	-9.1	-6.2	-3.4
Quasi-Fiscal Deficit	-18.4	-17.8	-13.6

a. Bank failures occurring in late 1995 are included in payments made in 1996. Failures occurring in 1997 are included in payments made in 1997.

Source: Zambia: Fiscal Management Report. World Bank Report 18552-ZA

53. Analysis of Zambia's fiscal stance indicates that to achieve solvency and sustainability, significant additional fiscal adjustment is required at all government levels. In order to evaluate the required fiscal efforts, we first calculated the primary deficit that would make the public sector solvent given the stock of public debt at the end of the previous period, the real interest rate, and the real GDP growth rate (the real interest rate was assumed to be constant throughout the period). This primary deficit required for solvency is then compared to the actual (or expected) primary deficit to find the adjustment needed for public sector solvency[18]. For fiscal sustainability, we first calculated the primary deficit needed to achieve debt sustainability (that is, to maintain the ratios of internal and external debt to GDP at the same levels). A measure of the required adjustment is calculated by comparing this sustainable primary deficit with the actual (or expected) primary deficit. All variables are expressed as percentages of GDP.

[18] This is equivalent to the so-called myopic one-period gap. See Olivier Blanchard (1990).

54. The results of the analysis are shown in Table 2 below. At the end of 1997, Zambia's fiscal balance remained far from the level required for solvency and sustainability, and fiscal adjustment equivalent to about 2.4 percent of GDP would be needed to bring about solvency in the central government deficit (Table 2). However, achieving fiscal solvency for the public sector as a whole (the quasi-fiscal deficit) would require fiscal adjustment on the order of 16.1 % of GDP. Because of a substantial real devaluation in 1997, fiscal adjustment to achieve sustainability was about 25.3% of GDP, a huge requirement beyond the ability of any government. A comparison of Table 1 and 2 also shows that while the conventional measure of fiscal deficit (Table 1) shows a decline from 1996 to 1997, the solvency and sustainability indicators (Table 2) show that an increase in fiscal adjustment was needed.

Table 2: Zambia: Public Sector Solvency and Sustainability (percentage of GDP)

	1995	1996	1997
Solvency			
Primary Balance	6.6	6.3	5.3
Real GDP Growth	-2.3	6.5	3.5
Domestic Debt	7.5	5.8	4.6
External Debt	207.5	188.1	178.5
Primary Balance for Solvency	22.9	6.7	7.7
Central Government Solvency Adjustment	16.3	.5	2.4
Non-financial Public Sector Solvency Adjustment	23.7	12.6	12.4
Quasi-Public Sector Solvency Adjustment	32.8	18.8	16.1
Sustainability			
Grants	5.5	5.9	4.8
Sustainable Primary Balance	15.0	11.2	30.6
Actual Central Government Primary Balance	6.6	6.3	5.3
Central Government Sustainability Adjustment	8.5	4.9	25.3
Non-financial Public Sector Sustainability Adjustment	15.8	17.1	35.4
Quasi-public Sector Sustainability Adjustment	24.9	23.2	39.0

Source: Zambia Fiscal Management Report, World Bank Report 18552ZA

55. We also ran additional simulations that examined the impact of slower export growth, lower grants, and a reduced external debt burden (Table 3). Reducing the annual rate of export growth from 5.8 percent to 2.9 percent in 1998 would require an adjustment effort of 18.5 percent of GDP. This result reveals just how difficult the situation is in Zambia and highlights the need for external debt relief. If both the stock of external debt and the

international rate of interest were reduced by half, the fiscal adjustment required to restore solvency and sustainability would be reduced to 9.2 percent and 20.7 percent of GDP.

Table 3: Zambia: Alternative Scenarios for Fiscal Adjustment (percentage of GDP)

	1997
Base Case	
Quasi Public Sector Solvency Adjustment	16.1
Quasi Public Sector Sustainability Adjustment	39.0
Reduced Export Growth (1.9 percent instead of 3.8 percent)	
Quasi Public Sector Solvency Adjustment	18.5
Quasi Public Sector Sustainability Adjustment	41.2
Reduced External Debt Burden (50 percent debt burden)	
Quasi Public Sector Solvency Adjustment	9.2
Quasi Public Sector Sustainability Adjustment	20.7

Source: Zambia Fiscal Management Report, World Bank Report 18552ZA

56. The government could take a number of urgent actions to help bring the non-financial public sector deficit and the quasi-fiscal deficit under control. These actions include the privatization of the remaining parastatals; use of privatization proceeds to reduce the public sector liabilities; freezing of arrears to all public entities and requiring all public agencies to come up with plans for speedy resolution of these arrears before new funds are released to them in the next budget year, setting out a medium-term program to reduce the non-financial public sector deficit and the quasi-fiscal deficit to sustainable levels; designing a plan to restore the solvency of the central bank and other public sector financial institutions; and improving the management of expenditures, especially the cash budget[19], to attain the medium-term fiscal targets.

57. The discussion of Zambia's fiscal solvency and sustainability points out several issues. First, it is important to distinguish fiscal performance at different levels of the government. While it is important to tackle the central government budget deficit, as Zambia has done until now, overall macroeconomic stability can only be achieved when the overall fiscal position of the country (including the fiscal positions of other levels of the government) has reached a sustainable level. Second, in a heavily indebted, low income country such as Zambia, debt relief, in both stock and flow terms, is an important tool for fiscal solvency and sustainability. Third, a real devaluation can carry heavy losses to the budget and makes it

[19] Since 1993, Zambia has used a cash budget system, under which expenditures are authorized only when revenues are received by the Ministry of Finance and Economic Development (MOFED).

much harder for a country to achieve fiscal sustainability, at least in the short term, so that policies for internal and external balance need to be closely coordinated.

Fiscal Solvency and Sustainability in India

58. India is also facing serious fiscal imbalances. The fiscal problems of India have been discussed in detail in various reports[20] and are analyzed here using the model presented above[21]. There is no estimate of quasi-fiscal deficit available. Table 3 below presents the results of the model for the three fiscal years 1995/1996, 1996/1997, and 1997/1998 respectively[22]. The public sector encompasses the central government, state governments, and non-financial public enterprises. Detailed data used in the analysis are provided in Annex Table A2, summarized in Table 4 below. In 1997/1998, for instance, solvency for the public-sector would require a primary surplus of not less than 3.1 percent of GDP, but the actual primary balance was a deficit of 1.7 percent. The gap between the desired and actual figures, shown as fiscal solvency adjustment, rises quickly, indicating a more serious problem than the increase in the conventional fiscal deficit would suggest.

Table 4: India: Public Sector Solvency and Sustainability (percentage of GDP)

	1995/96	1996/97	1997/98
Public Sector Solvency			
Primary Balance	-0.9	-1.1	-1.7
Real GDP Growth	8.0	7.3	5.0
Domestic Debt	67.5	64.9	66.8
External Debt	30.9	30.3	30.5
Primary Balance for Solvency	-3.5	2.5	3.1
Public Sector Solvency Adjustment	-2.5	3.5	4.8
Public Sector Sustainability			
Grants	0.1	0.1	0.1
Sustainable Primary Balance	-2.2	2.9	1.6
Actual Central Government Primary Balance	-0.9	-1.1	-1.7
Public sector Sustainability Adjustment	-1.2	4.0	3.3
Memorandum Items			
Conventional Deficit	-7.9	-7.8	-8.5

Source: World Bank staff calculation

[20] See, for example, India Country Economic Memorandum, Report Number 15882-IN, August 8, 1996, Chapter 3.

[21] The current version updated data from an earlier version of the paper, see Hinh Dinh (1995), but the empirical results are broadly in line with those, as well as with the India CEM (1996) and with the paper by Buiter (1994) although the last two papers used a slightly different methodology.

[22] The Indian fiscal year runs from April 1 to March 31.

59. The analysis of India's fiscal problems illustrate the strong linkages between the budget and financial repression. In 1997/98, under the assumption of a 10% real discount rate, or no financial repression, the public-sector in India would have required a primary surplus of not less than 3.1 percent of GDP in order to be solvent and about 1.6% of GDP primary surplus for fiscal sustainability. If the analysis were carried out using the actual government borrowing rate in the domestic markets (about 5%), the amount of fiscal adjustment would be smaller (Table 5). Thus, for example, with a real discount rate of 5%, roughly what the government is paying in the domestic market, the required solvency adjustment in 1997/98 would fall from about 4.8% of GDP .5% (Table 5) and the no adjustment is required for fiscal sustainability (negative value of 1.2 in Table 5). The difference between the first and the other columns of Table 5 reflects the implicit financial repression in the economy. The fiscal adjustment burden for India is clearly higher when the real discount rate is 10 percent than when it is 5 percent. The implication is that if, and when, financial liberalization takes effect, the burden on fiscal adjustment automatically increase sharply and this partly explains the reluctance of policy-makers to increase real interest rates. Thus, measures to liberalize interest rates would need to be accompanied by stringent fiscal polices over and above the explicit budgetary costs of such measures.

Table 5: India: Required Solvency and Sustainability Adjustments Under Alternative Discount Rates, 1997/98 (percent of GDP)

	Discount Rates		
	15%	10%	5%
Fiscal Solvency Adjustment	9.0	4.8	.5
Fiscal Sustainability Adjustment	7.8	3.3	-1.2

60. Perhaps even more important than the quantitative fiscal adjustment is the quality of fiscal adjustment. In recent years, India has succeeded in implementing fiscal reform aimed at reducing personal income tax as well as excise and customs duties to spur growth and to improve tax collection. The root cause of fiscal problems appears to lie not on the revenue side but on the expenditure side, particularly in two areas. First, strong political pressures coming from general elections tend to limit the ability of any minority government to deal effectively with the public-enterprise sector and privatization. Second, inter-governmental fiscal relations hamper the extent to which public expenditure can be controlled. The current structure allows states to finance more than 50 percent of their spending with central government transfers and thus dilute their fiscal responsibilities. At the moment, the center does not appear to be in a position to cut these tax transfers to the states, although it could reduce grants and loans allocated to them. Any serious fiscal effort would need to address these two issues.

61. Fiscal adjustments at the state and public-enterprise level will be a complex and time-consuming process, however. In the case of public-enterprises, further fiscal adjustment will require increasing profitability through a combination of restructuring, commercialization, and privatization. For the states, it will require increasing resource mobilization (mainly through improved cost recovery) and cutting unproductive expenditures. As financing from the central government to the states is reduced, this process will accelerate, although it is far from obvious that it will be orderly.

62. As the India case illustrates, there is a trade-off between fiscal and other macroeconomic policies (Table 5). If the political economy of the adjustment program is such that phasing out financial repression has a better chance of success than eliminating it in one swoop, it is possible to undertake sound, albeit slow, fiscal reform and adjust the fiscal burden gradually. This approach entails buying time for fiscal reform to bite. Conversely, relaxing the monetary stance to extract an inflation tax from the public would help fiscal sustainability only in the short run but would do nothing for the country's long-run solvency.

Fiscal Solvency and Sustainability in Argentina

63. Since 1991, Argentina has instituted a currency board which fixes the peso exchange rate at 1:1 to the US dollar. Thus, inflation tax, which is normally available to other countries, does not exist. Table 6 shows the proposed fiscal analysis for Argentina. By and large, the fiscal adjustments for the period 1995-1997 were sufficient except for 1996 when some further fiscal tightening would have been desirable. While the table shows that the fiscal adjustment path is adequate as far as solvency and sustainability are concerned, it also shows that there is not much room for maneuver in case of external or internal shocks. A small deviation from the expected revenue or expenditure path would require prompt fiscal adjustments.

Table 6: Argentina: Public Sector Solvency and Sustainability (percentage of GDP)

	1995	1996	1997
Public Sector Solvency			
Primary Balance	1.0	-1.4	0.5
Real GDP Growth	-4.0	4.8	8.6
Domestic Debt	9.0	8.4	12.5
External Debt	31.8	32.4	37.9
Primary Balance for Solvency	-0.6	1.1	-0.3
Public Sector Solvency Adjustment	-1.6	2.5	-0.8
Public Sector Sustainability			
Sustainable Primary Balance	-1.5	1.2	-0.4
Actual Primary Balance	1.0	-1.4	0.5
Public Sector Sustainability Adjustment	-2.5	2.6	-0.8

Memorandum Items			
Conventional Deficit	-.5	-2.9	-1.3

Source: Author's calculation

64. In the context of Argentina, since the nominal exchange rate is fixed by the currency board, this implies that it is important to focus on structural policies to improve productivity and/or to improve domestic resource cost. The analysis also indicates that under the envisaged policy framework, the adjustment paths are very tight and there is little room for coping with external or domestic shocks. Thus there is a need to maintain a substantial level of contingency fund to cope with the unexpected shocks.

VII. CONCLUSIONS

65. This paper proposes an approach to assess country fiscal performance over time and across countries. Data requirements are kept to a minimum, and both flow and stock variables on internal and external debt are taken into account. Two indicators measure fiscal adjustment efforts: fiscal solvency adjustment which measures how far additional fiscal efforts need to be undertaken to restore solvency to the public-sector; and fiscal sustainability adjustment which measures how far additional fiscal efforts are required to maintain the internal and external debt-to-output levels.

66. The approach proposed represents a minimum effort to take into account the linkages between fiscal, monetary, exchange rate policies and domestic interest rate and growth. These linkages exist in all economies in one form or another. They have been strengthened in the 1990's partly because of the adjustment and liberalization measures taken by developing countries and partly because of larger capital inflows into these countries. These inflows make economic management inherently more difficult and bring home two important aspects of fiscal policy. First, they point to the critical role of fiscal policy as an anchor for macro stability. When fiscal issues are under control, coordination of other macro policies becomes easier. When fiscal issues are part of the problem, the trade-offs between policy outcomes become pronounced, and management of capital flows becomes much more difficult. Second, the traditional boundary between internal and external balances has become more blurred and the number of channels through which inflation can be generated has increased. Recent instability in the world financial markets (the East Asian crisis) shows that in a financially integrated world, fiscal policy can play a role over and above the traditional one.

67. The framework proposed in this paper could be used to identify specific fiscal policies where actions are needed and to pinpoint the trade-offs between policies. Thus, in some countries, the foundation for a sustainable fiscal deficit has to be public-enterprise reform and privatization, while for others it is spending controls at the local level. The speed in achieving solvency and sustainability therefore depends on the political economy of implementing these measures without causing social problems. For instance, if the root

cause of the deficit is the wage bill, success depends on the design and implementation of a definite long-term lay-off strategy, including policies for retraining of workers. Similarly, in some countries, financial repression is high so that if (and when) the financial sector is liberalized, pressures on the budget will build up, over and above the required measures to attain solvency and sustainability. When combined with the solvency and sustainability analysis of external debt, the proposed framework can also be used to predict the occurrence of a crisis, either through fiscal policy as in Latin America in the early 1980s, or through accumulation of short-term external debt as in East Asia in the late 1990s.

68. There are several limitations to the approach proposed here. First, the framework does not contain any behavioral relationship underlying adjustment indicators. Thus, for example, while the model allows estimation of the impact of a 10 percent devaluation on expenditures, (and therefore on the budget in the short term), it ignores the impact of the devaluation on exports, on GDP growth, and consequently on government revenues. Such impact can only be estimated on the basis of country-specific parameters[23]. In return for this cost, the framework developed here can be applied to all countries because it only relies on accounting identities. Second, there is no indication of the desired or optimal time path to achieve solvency or sustainability objectives. How long the adjustment should be carried out is a matter of judgment that only policy-makers can make. Third, the analysis would need to be supplemented by other qualitative judgments, especially on country-specific fiscal issues along the line suggested in section IV. Nevertheless, the analysis of fiscal solvency and sustainability is useful in analyzing key fiscal issues over time and across countries, providing valuable insights into the adequacy and pace of policy initiatives, and identifying the trade-offs between economic policies.

[23] A Computable General Equilibrium model would be more suitable for this purpose, but cross-country comparison for policy analysis would be virtually impossible.

REFERENCES:

Agenor, Pierre-Richard and P. Montiel (1996) Development Macroeconomics, Princeton University Press, Princeton, New Jersey.

Bacha, Edmar L. " A Three-Gap Model of Foreign Transfers andthe GDP Growth Rate in Developing Countries", paper presented at an IMF Seminar, 1989.

Blanchard, Olivier (1990), 'Suggestions for a new set of fiscal indicators', OECD, Department of Statistics Working Paper, No. 79, April.

Blejer, Mario and Cheasty, Andreana, Eds. How to Measure the Fiscal Deficit. Washington, D.C.: The International Monetary Fund, 1993.

Boskin, Michael. "Taxation, Saving and the Rate of Interest." Journal of Political Economy, vol. 86, April 1978.

Buiter, Willem H. "A Guide to Public Sector Debt and Deficits." Economic Policy, November 1985, pp. 14-79 .

Buiter, Willem H. (1990) Principles of Budgetary and Financial Policies, MIT Press, Cambridge, Maassachusetts.

Bulow, Jeremy and Rogoff, Kenneth. "Sovereign Debt: Is to Forgive to Forget?" American Economic Review, 1989, p. 79.

Cline, William R. International Debt: Systemic Risk and Policy Response. Washington, D.C.: Institute for International Economics, July 1984.

Cohen, Daniel. "How to Evaluate the Solvency of an Indebted Nation." Economic Policy, November 1985, pp. 140-167.

Cohen, Daniel. Monnaie, Richesse, et Dette des Nations. Paris, France: Centre National de la Recherche Scientifique, 1986.

Diamond, Peter. "National Debt in a Neoclassical Growth Model." American Economic Review, vol. 55, no. , 1965.

Dinh, Hinh T. (1995), 'Fiscal solvency and sustainability in creditworthiness analysis', World Bank, Country Creditworthiness Division, May.

Drazen, Allan and Helpman, Elhanan. "Stabilization With Exchange Rate Management." Quarterly Journal of Economics, 1987, p. 52.

Easterly. William and Rebelo, Sergio. Fiscal Policy and Economic Growth: An Empirical Investigation. NBER Working Paper no. 4499, National Bureau of Economic Research , October 1993.

Eaton, Jonathan and Gersovitz, Mark. "Debt with Potential Repudiation: Theoretical and Empirical Analysis." Review of Economic Studies, 1981.

Frankel, Jacob and A. Razin (1996) Fiscal Policies and Growth in the World Economy, MIT Press, Cambridge, Massachusetts.

Kiguel, Miguel A. and Liviatan, Nissan. "Exchange-Rate-Based Stabilization in Argentina and Chile." World Bank Policy Research Working Paper no. 1318., Washington, D.C.: The World Bank.

van Wijnbergen, Sweder. "External Debt, Inflation, and the Public Sector: Toward Fiscal Policy for Sustainable Growth." The World Bank Economic Review, vol. 3, no. 3, 1990, pp. 297-320.

van Wijnbergen, Sweder, R. Anand, A. Chhibber, and R. Rocha (1992) External Debt, Fiscal Policy, and Sustainable Growth in Turkey, Published for the World Bank by the Johns Hopkins University Press, Baltimore, Maryland.

World Bank, 1999, Global Economic Prospects.

Annex Table A1

Table A1: Domestic Debt and Public-Sector External Debt

Average 1994-1996, in percentage of GDP

Country	Domestic Debt	Public-Sector External Debt	Country	Domestic Debt	Public-Sector External Debt
Algeria	21.0%	70.6%	Jordan	19.8%	104.0%
Argentina	6.2%	24.4%	Kenya	21.7%	69.1%
Bangladesh	9.5%	54.8%	Lebanon	52.0%	10.7%
Belarus	2.3%	28.0%	Lithuania	2.0%	6.6%
Bolivia	6.5%	74.8%	Malawi	10.4%	126.3%
Brazil	14.2%	15.4%	Malaysia	38.4%	18.3%
Bulgaria	76.4%	83.7%	Mauritius	9.6%	29.0%
Cameroon	22.5%	96.6%	Mexico	6.4%	26.9%
Chile	9.0%	15.3%	Morocco	34.4%	64.6%
China	5.7%	13.8%	Nigeria*	29.8%	47.2%
Colombia	8.5%	19.2%	Pakistan	18.5%	43.2%
Costa Rica	4.8%	34.1%	Panama	0.0%	37.9%
Cote d Ivoire	30.1%	149.0%	Papua New Guinea	16.0%	31.0%
Croatia	21.0%	13.1%	Paraguay	1.0%	16.7%
Dominican Republic	5.0%	30.3%	Peru	1.9%	38.2%
Egypt	38.5%	53.0%	Philippines	46.9%	41.8%
El Salvador	3.3%	22.1%	Poland	21.3%	34.1%
Fiji*	30.1%	8.6%	South Africa	55.7%	16.2%
Gabon	28.3%	80.9%	Thailand	2.0%	11.2%
Ghana*	12.0%	75.7%	Trinidad & Tobago	18.0%	33.8%
Guatemala*	0.7%	16.9%	Tunisia	18.6%	49.3%
Honduras*	24.3%	105.5%	Turkey	14.5%	31.9%
Hungary	82.5%	53.2%	Uganda	1.2%	58.8%
India	67.5%	26.9%	Uruguay	5.0%	22.7%
Indonesia	1.0%	33.0%	Venezuela	12.1%	41.6%
Jamaica	34.1%	72.1%	Zambia	5.0%	111.1%
			Zimbabwe	37.6%	51.2%

Sources: World Bank and IMF Reports.

: Fiscal data only available until 1995.

Annex Table A2

Table A2: INDIA
COUNTRY and PUBLIC SECTOR SOLVENCY and SUSTAINABILITY

	1995/96	1996/97	1997/98
Country Solvency			
Non-Interest Current Account (NICA) ($ millions)	-1,650	-588	-365
NICA/Exports	-3.5%	-1.1%	-0.7%
Real Export Growth	31.5%	7.0%	10.1%
Difference between 10% and Real Export Growth	-21.5%	3.0%	-0.1%
Country Solvency Index	-43.1%	5.5%	-0.1%
Country Solvency Adjustment (% of Exports)	-39.6%	6.7%	0.5%
Public Sector Solvency			
Primary Balance (LCU billions)	-115	-151	-266
Primary Balance/GDP	-0.9%	-1.1%	-1.7%
Real GDP Growth	8.0%	7.3%	5.0%
Difference between 10% and Real GDP Growth	2.0%	2.7%	5.0%
Public Sector Solvency Index	-3.5%	2.5%	3.1%
Public Sector Solvency Adjustment (% of GDP)	-2.5%	3.5%	4.8%
Country Sustainability			
Gross Disbursements (LT+IMF+ST) ($ millions)	7,140	6,682	9,044
Gross Disbursements/Exports	15.0%	12.8%	16.3%
Interest Payments (LT+IMF+ST) ($ millions)	4,605	4,441	5,514
Interest Payments/Exports	9.7%	8.5%	9.9%
Net Disbursements (LT+IMF+ST) ($ millions)	220	37	2,493
Net Disbursements/Exports	0.5%	0.1%	4.5%
DOD/ Exports	198.8%	179.7%	169.9%
Sustainable NICA Balance(- = deficit)	-32.4%	7.8%	-11.7%
Actual NICA (- = deficit)	-3.5%	-1.1%	-0.7%
Country Sustainability Adjustment (% of Exports)	-28.9%	9.0%	-11.0%
Public Sector Sustainability			
Real GDP Growth Rate	8.0%	7.3%	5.0%
Exports/GDP	15.5%	16.8%	17.9%
DOD/GDP	30.9%	30.3%	30.5%
Devaluation Rate	9.2%	1.0%	-6.4%
Grants/GDP	0.1%	0.1%	0.1%
Sustainable Primary Balance (- = deficit)	-2.2%	2.9%	1.6%
Actual Primary Balance (- = deficit)	-0.9%	-1.1%	-1.7%
Public Sector Sustainability Adjustment (% of GDP)	-1.2%	4.0%	3.3%
Conventional Fiscal Deficit	-7.9%	-7.8%	-8.5%
Memorandum Items:			
Domestic Debt/GDP	67.5%	64.9%	66.8%
Domestic Revenue/GDP	22.0%	21.0%	21.5%

DATA INPUT	1995/96	1996/97	1997/98
Current Account Balance (current US$ mil.)	-6255	-5029	-5879
Interest Payments (current US$ mil.)	4605	4441	5514
Exports of Goods and NFS (current US$ mil.)	39657	41607	45109
Factor Receipts (current US$ mil.)	1429	1073	1561
Workers Remittances (current US$ mil.)	6404	9326	8906
Exports of Goods and Services (current US$ mil.)	47490	52006	55576
Exports (GNFS) (current LCU mil.)	1258510	1346758	1482446
Overall Balance (- Deficit) (current LCU mil.)	-956802	-1104796	-1322874
Interest on External Debt (current LCU mil.)	52182	64818	55462
Interest on Domestic Debt (current LCU mil.)	789658	888888	1001800
Total Current Revenues (current LCU mil.)	2684936	2957051	3354666
GDP at Current Market Prices (LCU mil.)	12179630	14098490	15635520
GDP at Constant Market Prices (LCU mil.)	10222850	10964330	11510140
GDP at Current Market Prices (US$ mil.)	305504	308848	309760
Gross Disbursements (LT+IMF+ST) (US$ mil.)	7140	6682	9044
Net Disbursements (LT+IMF+ST) (US$ mil.)	220	37	2493
Interest Payments (LT+IMF+ST) (US$ mil.)	4605	4441	5514
Debt Outstanding (LT+IMF+ST) (US$ mil.)	94387	93435	94404
Index REER X-rate Index (1990=100), IMF	176	177	166
Official Capital Grants (US$ mil.)	345	410	379
PPG debt/GDP (current $US) (Ext. Debt)	26%	25%	26%
Total Govt. Domestic Debt (General Govt.) (curr. LCU mil.)	4962925	5734965	6698931
Net Domestic Credit to Govt. (current LCU mil.)	2577780	2886200	3306190
Domestic Debt (current LCU mil.) (Public Finance)	8218824	9154199	10441148
Domestic Debt/GDP (current LCU mil.) (Public Finance)	67%	65%	67%

Source: World Bank Country Data and Author's Calculation

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